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STUDY G-II-E

SPORT FISH STUDIES
RAINBOW TROUT IN LOWER TALARIK CREEK-KVICHAK

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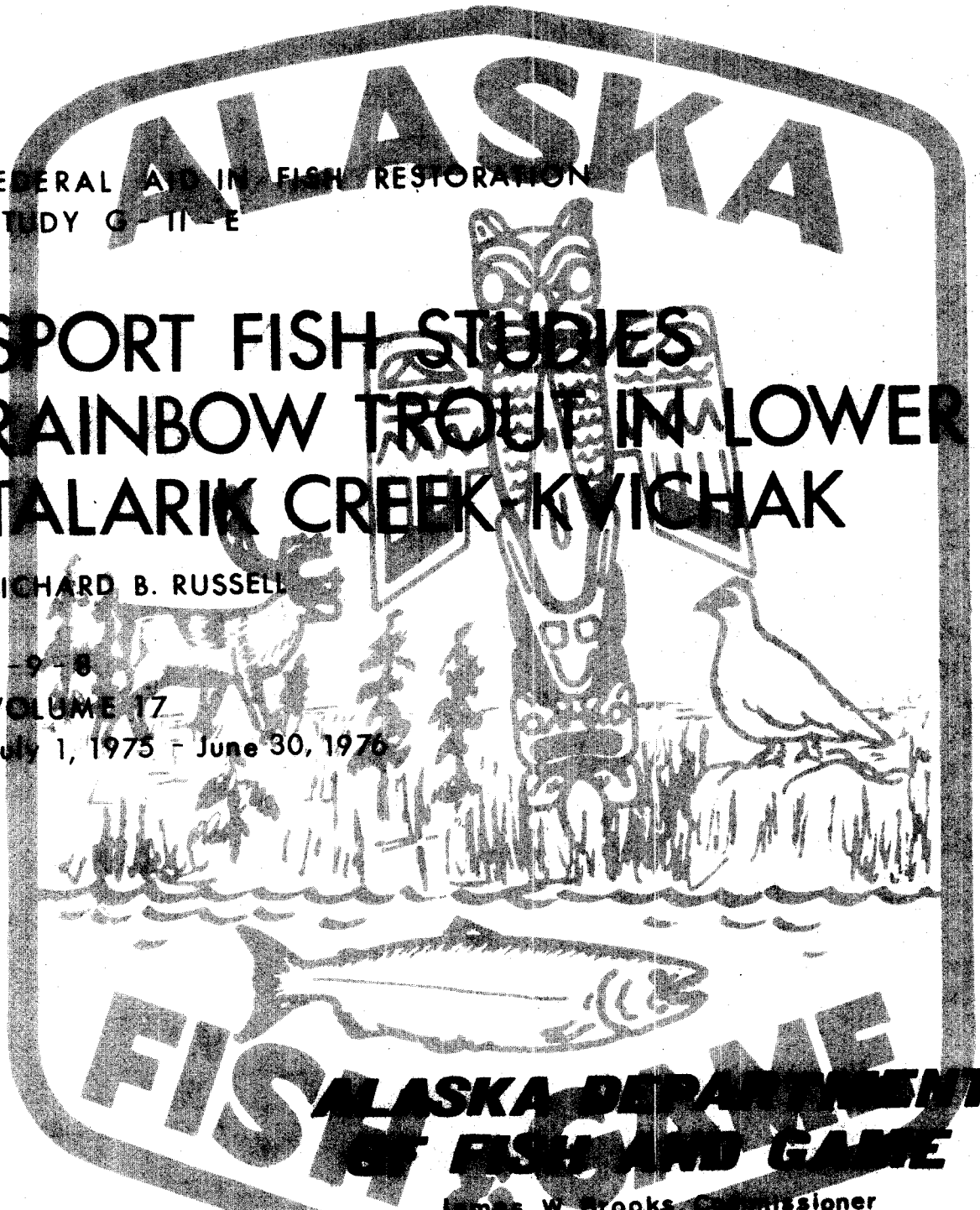

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Volume 17 Study G-II-E

STATE OF ALASKA

Jay S. Hammond, Governor

Annual Performance Report for

RAINBOW TROUT LIFE HISTORY STUDIES IN LOWER TALARIK CREEK-KVICHAK DRAINAGE

by

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TABLE OF CONTENTS

Volume 17 Study No. G-II

RESEARCH PROJECT SEGMENTS

State: ALASKA Name: Sport Fish Investigations of Alaska.

Project No.: F-9-8

Study No.: G-II Study Title: SPORT FISH STUDIES

Job No.: G-II-E Job Title: Rainbow Trout Life History Studies in Lower Talarik Creek-Kvichak Drainage

Period Covered: July 1, 1975 to June 30, 1976.

ABSTRACT

The Lower Talarik Creek weir was reassembled and operated for 128 days during the summer of 1975, marking the fifth consecutive year of the rainbow trout, Salmo gairdneri (Richardson), life history study. Three hundred and four upstream and 493 downstream migrant rainbow trout were captured. Each was examined for tags, length, weight, and condition.

Lower Talarik Creek rainbow trout spawning areas were surveyed to estimate the magnitude of the spawning population. An estimated 1,100 rainbow trout spawned in the stream in 1975.

Fourteen female and five male Lower Talarik Creek rainbow trout were artificially spawned, yielding an estimated 25,300 eggs for the State's native brood stock program.

Anglers visiting Lower Talarik Creek were interviewed to determine catch and effort trends. A seasonal catch rate of 1.54 rainbow trout per angler hour was achieved. Anglers retained 127 rainbow trout.

BACKGROUND

The drainages of several major rivers entering Bristol Bay, in western Alaska, have become widely known in recent years as areas producing high quality rainbow trout fishing. Of these, the Kvichak River drainage is perhaps the most widely acclaimed.

The Kvichak drainage drains an area of approximately 8,000 square miles. It includes Lake Iliamna (1,115 square miles), the State's largest lake, as well as a number of smaller lakes and tributaries. Its waters are inhabited by 22 known fish species (Bond and Becker, 1963), all naturally occurring. Rainbow trout inhabit both lake and stream areas.

Angler use figures for the Kvichak watershed are lacking prior to 1960 and use is believed to have been fairly light. During the 1960's a number of guides, a military recreation camp, and air charter services began emphasizing various areas within the drainage in their operations. The 1968 designation, by the Alaska Board of Fish and Game, of certain waters within the drainage as "Trophy Fish Areas" drew more attention to the area and its fisheries.

Beginning in 1964 the Alaska Department of Fish and Game initiated programs at Igiugig (on the Kvichak River) and at Lower Talarik Creek (a tributary to Lake Iliamna) designed to provide information on rainbow trout population age structure, movement, and angler utilization. These programs yielded some information, but by 1968 it was apparent that a more intensive effort was necessary to gain life history information. In the Annual Project Report of Progress for 1968 (Paddock, 1969), it was recommended that a weir be established at Lower Talarik Creek in order to gather data related to rainbow trout spawning population movements.

The rainbow trout life history studies project was formally initiated at Lower Talarik Creek in the spring of 1971. It was designed to provide information on population numbers, age, length, sex composition, migrational timing, spawning, and additional aspects of rainbow trout life history. A temporary weir was constructed in May, 1971 on the West Fork of Lower Talarik Creek and was operated until mid-June. Following its removal, efforts were made to construct a much larger and more permanent weir structure downstream near the stream outlet. These efforts failed due to engineering problems.

In the spring of 1972 a second temporary weir was constructed on the West Fork and operated as in 1971. Later, during July, a permanent weir structure was assembled approximately 3/4 of a mile upstream from the Lower Talarik Creek outlet. This structure has remained in place and has been operated during the summer field seasons, 1972 through 1975.

RECOMMENDATIONS

1. Continue collection of creel census information at Lower Talarik Creek to determine catch and effort trends.

2. Continue rainbow trout spawning surveys at Lower Talarik Creek.

3. Write a project completion report summarizing the findings of the rainbow trout life history studies conducted at Lower Talarik Creek from May 1971 through June 1976.

4. Remove all structures and materials from the weir site at Lower Talarik Creek.

OBJECTIVES

1. To continue a basic life history study of rainbow trout in Lower Talarik Creek, a tributary to Lake Iliamna.

2. To continue monitoring the recreational sport fishery on rainbow trout stocks at Lower Talarik Creek.

TECHNIQUES USED

Fish were captured using a 120-foot collapsible weir, a type V backpack electrofisher (SmithRoot Company), and hook and line.

The weir, of structural steel construction, supported two traps: a 6' x 10' "wulf" type trap designed to capture downstream migrants, and a 6' x 10' fyke trap designed to capture upstream migrants. Weir screens were constructed of 5/8 inch metal mesh and were reversible to facilitate cleaning.

Fish captured were checked for the presence of tags, and sampled to determine their fork length, weight, sex, maturity, and general condition. Fork lengths were determined using rigid portable measuring boards and were recorded to the nearest millimeter. Weights were obtained using a Chatillon 9 kilo autopsy scale, accurate to 10 grams. The sex and maturity of rainbow trout captured were recorded whenever these were readily identifiable.

Scale samples were taken from all rainbow trout captured at the weir (May 21 - September 26, 1975). Scales of non-tagged fish were removed from the left side between the lateral line and dorsal fin insertion. Scales were selected from the right side of previously tagged fish to minimize the selection of regenerate scales. Scales were cleaned, mounted on numbered gum cards, and impressions were made in 0.002 inch thick cellulose acetate (2.5" x 5"). Scale impressions were read to determine age, using a microprojector.

Ages of sampled rainbow trout were determined by counting annular rings from selected scales. The otoliths of several rainbow trout were examined as an alternate ageing method to check the validity of ages obtained by scale reading.

Stomach contents from rearing juvenile rainbow trout were preserved in 10% formalin and subsequently identified using a Bausch and Lomb 1X-2X dissecting microscope.

Spawning ground escapement counts were obtained by foot surveys.

The abundance of juvenile rainbow trout in index side channels was investigated using backpack electroshocking gear.

Water temperatures were collected using a Taylor maximum-minimum registering thermometer submersed in the stream near the weir site.

Anglers were interviewed to determine creel information, effort, and gear preference. Creel census data were expanded by month to determine total estimated "angler effort" and "rainbow trout harvest" using the following ratio proportion formula:

$$\text{Angler effort} \quad \frac{\text{No. anglers checked}}{\text{No. angler hours checked}} = \frac{\text{No. anglers observed}}{\text{Unknown (total angler hours)}}$$

$$\text{Rainbow trout} \quad \frac{\text{No. anglers checked}}{\text{No. rainbow trout checked}} = \frac{\text{No. anglers observed}}{\text{Unknown (total rainbow trout harvest)}}$$

The types of gear used by sport fishermen at Lower Talarik Creek were identified and angler success using different gear types compared. For purposes of this comparison, flies and lures were defined as follows:

Flies - Terminal tackle constructed by methods known as fly tying, including nymphs, dry, wet, and streamer flies.

Lures - Terminal tackle other than flies, including spoons, spinners, jigs, and plugs.

Age, weight, length, and migration data were entered on Sport Fish Division field data collection forms. The data were then key punched onto cards for future listings via computer.

FINDINGS

Results

Rainbow trout:

The Lower Talarik Creek weir was installed on May 21 and operated until September 26, 1975. During this period a total of 797 rainbow trout, Salmo gairdneri (Richardson), entered the weir traps and were sampled. Of these, 304 were upstream migrants and 493 were downstream migrants. This is a considerably smaller number of rainbow trout captured than during pre-

vious seasons. This reduction in the number of rainbow trout captured is due mainly to the fact that the upmigration of spring spawners occurred prior to weir installation, and the second upmigration of fish in the fall occurred after weir removal. In addition, roughly 2/3 of the spawning population either remained in the upper reaches of the stream after spawning or somehow got past the weir on their downmigration. Length, weight, age, state of maturity, and migration data were collected from fish that were captured.

Spawning ground surveys were conducted at Lower Talarik Creek during late May and early June to estimate the magnitude of the spawning population. An estimate of 1,100 spawners was attained. The peak of spawning activity was estimated to have occurred on May 23. Spawning was complete by June 15. Lower Talarik Creek rainbow trout spawning population estimates for the years 1971-1975 appear in Table 1. It appears that the spawning population has remained fairly stable throughout this time period.

For the second consecutive year, the Alaska Department of Fish and Game conducted a rainbow trout egg take at Lower Talarik Creek. Fourteen female and five male rainbow trout were held in pens until ripe in early June and spawned by personnel from the Fire Lake Hatchery. An estimated 25,300 eggs were obtained. These were transported to the Fire Lake Hatchery at Eagle River, Alaska, for incubation as part of the State's native brood stock program.

During the 1975 field season 60 rainbow trout previously tagged at Lower Talarik Creek were recaptured. A total of 49 (82%) were recaptured in Lower Talarik Creek while 11 (18%) were recovered from other areas within the Kvichak drainage.

Creel Census:

Anglers visiting Lower Talarik Creek during 1975 were interviewed by Department personnel to determine catch, effort, and gear preference data. As in past years (1969-1974), only those anglers fishing the lower 3/4 miles of the stream were interviewed. Some angling does occur in the upper reaches of the stream, but a majority of the rainbow trout angling occurs in the lower stream area. The creel census results are presented in Tables 2 and 3. It appears that rainbow trout angling in the stream during 1975 was very productive. One hundred forty-six anglers were interviewed. They fished an estimated 271 angler days and caught an estimated 1,665 rainbow trout. The mean rainbow trout catch per angler hour was 1.54.

Table 1. Rainbow Trout Spawning Population Estimates, Lower Talarik Creek, 1971-1975.

Date	Estimated Spawning Population	Duration of Spawning	Spawning Peak
1971	800	5/14-6/17	5/30
1972	600*	5/25-6/17	6/6
1973	1,000	4/20-5/30	5/10
1974	1,200	4/26-5/30	5/3
1975	1,100	5/15-6/15	5/23
5-year average	940		

*Based on surveys of the West Fork, expanded to include the entire stream.

Table 2. Recreational Effort and Harvest, Lower Talarik Creek, 1971-75.*

Year	Angler Days Observed	Angler Days Checked	Angler Hours	Rainbow Trout Caught	Catch Per Angler Hour	Rainbow Trout Retained
1971	587	414	2,314	2,045	0.88	388
1972	316	245	1,652	760	0.46	143
1973	381	226	1,563	964	0.62	126
1974	259	247	1,041	500	0.48	73
1975	271	264	1,084	1,665	1.54	127
5 year Average	363	279	1,531	1,187	0.79	171

*Expanded data.

TABLE 3. Recreational harvest data, Lower Talarik Creek, 1975.*

Anglers interviewed	146	
Angler days observed	271	
Angler hours observed	1,084	
Rainbow trout caught	1,665	
Rainbow trout retained	127	
Resident angler days	119	(%=44)
Non-resident angler days	152	(%=56)
Total	271	
No. angler days in which flies were used	114	(%=42)
No. angler days in which lures were used	143	(%=53)
No. angler days in which gear unknown	14	(%= 5)
Total	271	
No. angler hours in which flies were used	488	(%=45)
No. angler hours in which lures were used	531	(%=49)
No. angler hours in which gear unknown	65	(%= 6)
Total	1,084	
No. rainbow trout caught using flies	883	(%=53)
No. rainbow trout caught using lures	749	(%=45)
No. rainbow trout caught, gear unknown	33	(%= 2)
Total	1,665	
No. rainbow trout retained by fly anglers	58	(%=46)
No. rainbow trout retained by lure anglers	66	(%=52)
No. rainbow trout retained by anglers, gear unknown	3	(%= 2)
Total	127	
No. rainbow trout caught per angler hour using flies	1.81	
No. rainbow trout caught per angler hour using lures	1.41	
No. rainbow trout caught per angler hour, gear unknown	0.51	
No. rainbow trout retained per angler hour by fly fishermen	0.12	
No. rainbow trout retained per angler hour by lure fishermen	0.12	
No. rainbow trout retained per angler hour, gear unknown	0.05	
No. rainbow trout retained per angler day by fly fishermen	0.51	
No. rainbow trout retained per angler day by lure fishermen	0.46	
No. rainbow trout retained per angler day by anglers, gear unknown	0.21	

* Expanded data

Discussion

A considerable volume of length, weight, age, migration, and stage of maturity information, as well as other data, was collected during 1975. The bulk of these data are presently awaiting computer listing and are not available for reporting at this time. However, a project completion report will be prepared during 1976-1977 summarizing the findings of the rainbow trout life history studies from May 1971, through June 1976, and the 1975 data will be presented as an integral part of this report.

The recent relative stability in the Lower Talarik Creek rainbow trout spawning population is encouraging. It indicates, to an extent, that present angling regulations are adequately protecting the stream's brood stock.

Angling pressure at Lower Talarik Creek, as measured by angler hours fished, has dropped somewhat over the last five years (Table 2). Prior to 1972 the use of natural bait (salmon eggs) was a legal sport fishing method. This form of bait was made illegal in 1972 and is probably partly responsible for the decline in visitation, and catch thereafter. The high catch per angler hour reported for 1975 was the result of anglers pursuing juvenile rainbow trout more extensively than in past years. This was due to natural channel changes that caused the anglers to move their efforts upstream where more juveniles were encountered. Also, during 1975, due to the late spring breakup, rainbow trout spawning was delayed and, consequently, anglers found a fair number of post spawners available during the early weeks of the season, with a resultant slight increase in catch of these fish. Most anglers missed the inmigration of fall lakerun rainbow trout. The upmigration occurred during the last week of September. As surface ice was beginning to form on lakes at that time, float plane operations were curtailed and angling pressure dropped off.

Following the 1975 field season, it was decided to discontinue further use of the weir at Lower Talarik Creek. The weir has served its purpose within the scope of present management needs. Through its use, data, primarily of a length, weight, and condition nature, have been collected from migrating rainbow trout. Migrations have been identified and many tags have been recovered. No further tagging is anticipated and the data on population age structure are adequate for present management needs. Total population estimates have not been obtained but do not appear feasible through use of the weir due to problems associated with migrations occurring under the ice, and with dispersion of fish into Lake Iliamna. The weir foundation, left in the stream following disassembly in the fall of 1975, will be removed in the summer of 1976.

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Please note:

As mentioned in the "Discussion" a project completion report will be submitted next year summarizing the findings of the rainbow trout life history studies from 1971 through 1976.